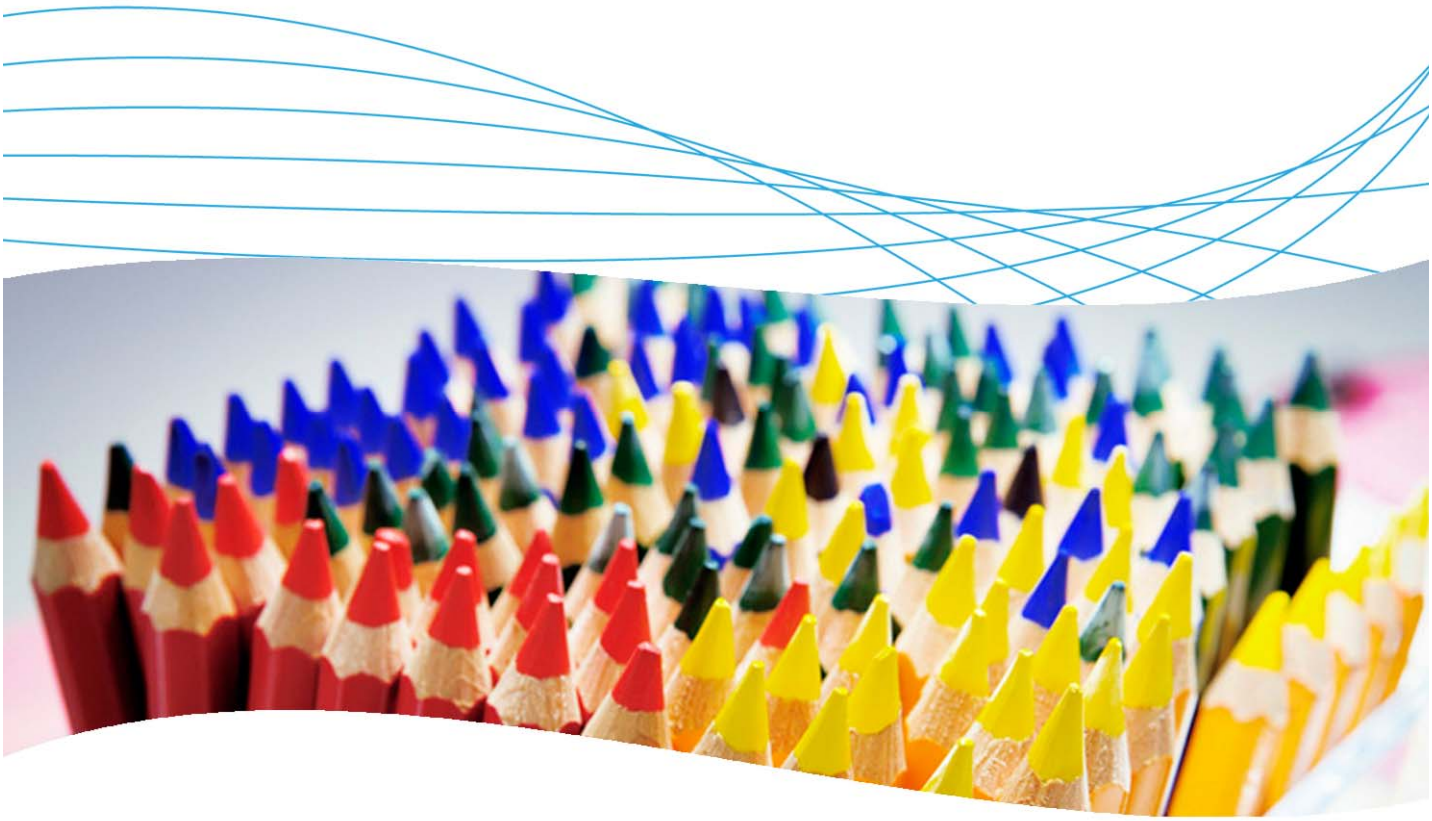
An HP ProCurve Networking Application Note

Interoperability between ProCurve WESM zl and Siemens Gigaset SL75 wireless phone



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1. Introduction

This document describes the interoperability of a ProCurve wireless services solution coupled with the Siemens Gigaset SL75 WLAN phone to provide a secure Voice over WLAN (VoWLAN) solution with the following services:

- Secure wireless encryption with WPA/WPA2 (pre-shared key)
- Fast roaming
- Quality of Service (via WMM) on the wireless media
- Unscheduled Automated Power Save Delivery (UAPSD)

2. Prerequisites

You will need the following equipment:

- ProCurve Switch 5406zl or 8212zl with the latest firmware version
- Wireless Edge Services Module zl (WESM zl) plugged into a slot of the 5406zl
- Two ProCurve radio ports (RP210 or RP230)
- Siemens Gigaset SL75 WLAN phone

The wireless services module and radio ports are installed in the 5406zl or 8212zl. The radio ports have been discovered.

For more information on this configuration please refer to ProCurve Application Note AN-M1, *How to extend your wired network to wireless*.

3. Network architecture

Figure 1 details the configuration referenced in this application note.

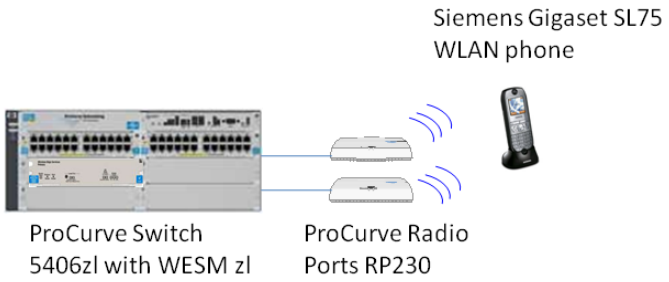


Figure 1. Configuration for ProCurve-Siemens WLAN phone interoperability

4. Secure wireless WPA2-PSK encryption

The Siemens Gigaset SL75 WLAN phone supports the following options:

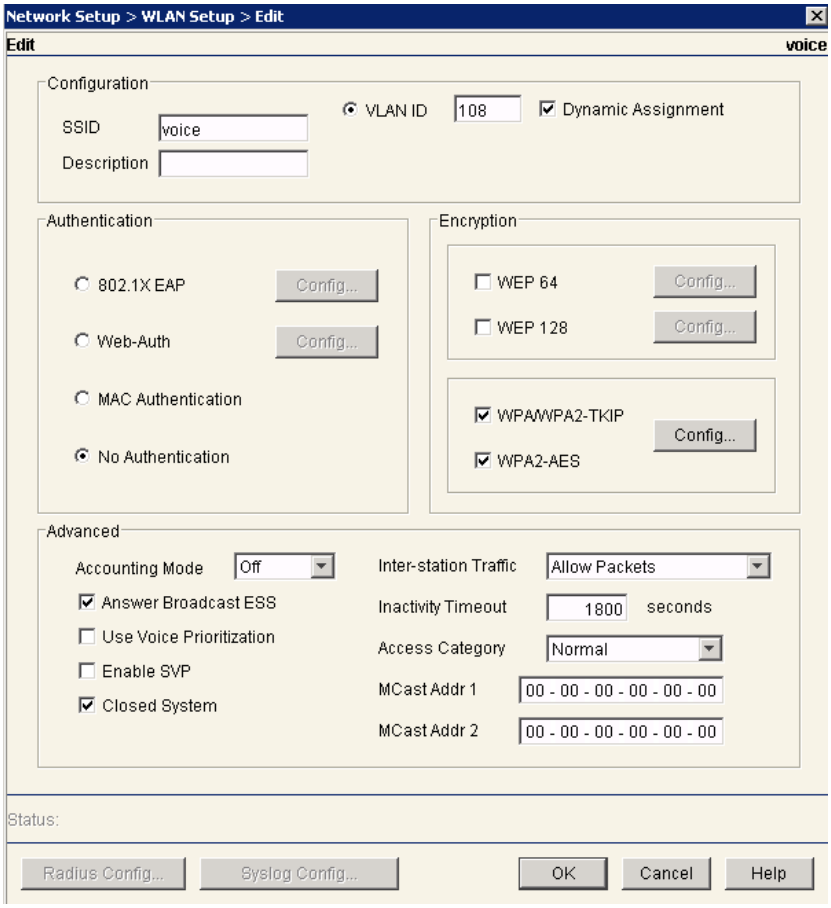
- For authentication, the phone support 802.1X with the following EAP protocols: LEAP and EAP-TLS
- For encryption, the phone supports:
  - WEP
  - WPA
  - WPA-PSK

This application note describes the configuration of WPA2-PSK encryption.

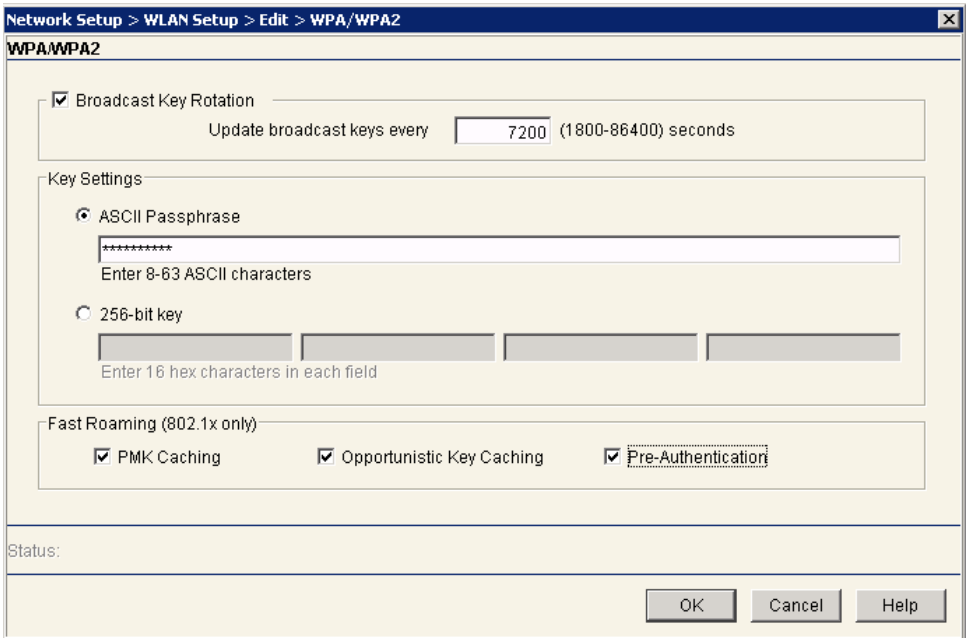
4.1 Configure the ProCurve WESM

To configure the ProCurve WESM for secure wireless encryption via WPA2-PSK:

1. On the wireless edge services module, go to Network Setup > WLAN Setup and create a new WLAN called voice.
2. Configure this WLAN as follows:
   - SSID: voice
   - VLAN ID: The VLAN you want to be assigned to the phone. This VLAN must be tagged on the WESM uplink from the switch menu. (For details, refer to Application Note AN-M1, or to the *Wireless Services Module Administrator Guide*).
   - Authentication: No Authentication.
   - Encryption: Enable both WPA/WPA2 TKIP and WPA2 AES.



3. Click the Config button, and configure the pre-shared key as follows.
    - ASCII passphrase: procurve
    - Enable all three Fast Roaming options (PMK Caching, Opportunistic Key Caching, Pre-Authentication).



4. Click OK to return to the main Edit window.
5. In the main Edit window, under Advanced, select Closed System, then click OK.
6. Finally, to enable the new WLAN, at the bottom of the WLAN list window click the Enable button.

4.2 Configure the Siemens wireless IP phone

You can configure the Siemens Gigaset SL75 WLAN phone from its screen menus or from the Web configurator.

4.2.1 Configure the Siemens phone from the screen menu:

1. From the main screen of the phone, click on the bottom right icon and use the arrows to reach the Settings menu (the wrench icon).
2. Click OK to open this Menu.
3. Open Network Config at the bottom of the list and click OK.
4. Then open Access Profiles.
5. Click on Profile01 and View.
6. In the Profile menu click on Edit and configure the different settings as follows:
    - Profile Name: voice
    - WLAN: Click Edit and configure the WLAN parameters as follows:
        - SSID: voice
        - Authentication: None
        - Encryption Type: WPA PSK TKIP
        - Password mode: ASCII
        - Pre-shared key: procurve

    Then click on Save to save the profile configuration.

7. If you want to choose an SIP provider, click Provider. (You can define the SIP settings from the Web configurator.) SIP providers are outside the scope of this Application Note.
8. Click on the red icon to exit the Profile menu.
9. The phone screen displays a message that indicates that a reboot is mandatory to activate the new settings. Click Yes to reboot.

4.2.2 Configure the Siemens phone from the Web interface:

The Web configurator is the Web interface for the Siemens phone. It allows making all settings on the phone via a PC.

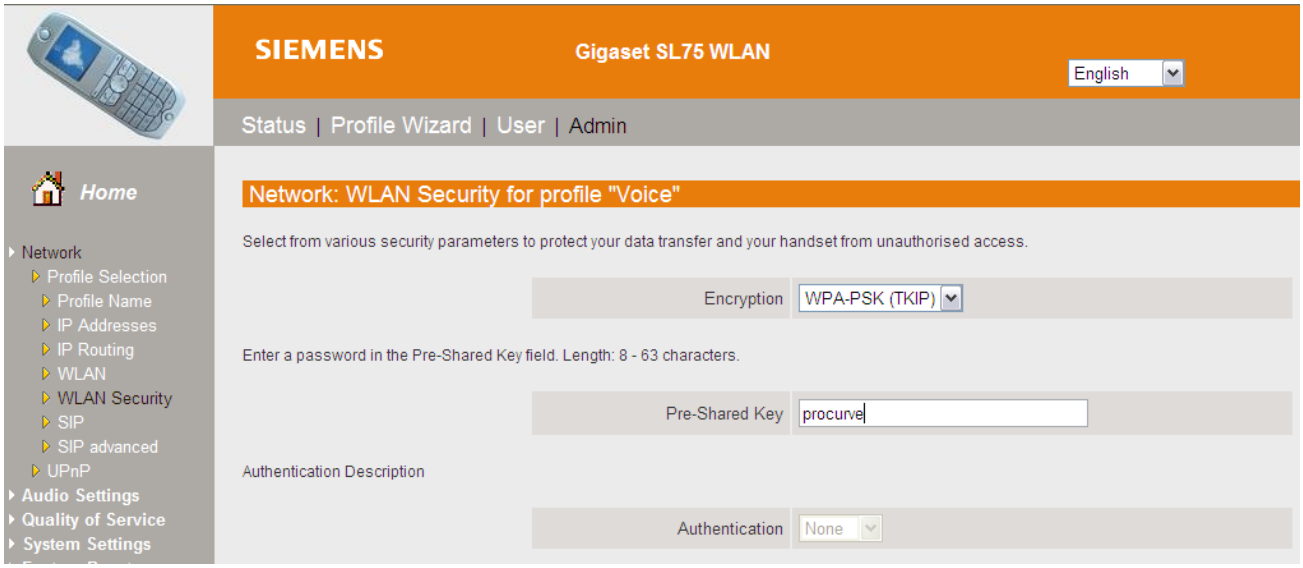
To connect to the phone Web configurator for the first time:

1. On the phone display screen, select the Scan key to have the phone search for and associate to an open WLAN (no encryption, no authentication).
2. Connect a PC to the same WLAN as the phone, open a web browser and access the Web configurator at: http://*<phone_ip_address>*
3. On the Web configurator screen go to Admin and choose Network > Profile Selection from the left panel. You see a window from which you can define a new profile or edit an existing one.

4. For this example, click Edit to edit the Voice profile.

   You can choose other links to configure IP addresses (static or DHCP), IP Routing, WLAN parameters and WLAN Security by opening the corresponding menus from the links in the left panel.

5. Go to the Network > WLAN Security window and configure WPA-PSK for the Voice profile with the following parameters:
   - Encryption: WPA-PSK(TKIP)
   - Pre-Shared Key: procurve
   - Authentication: None



4.3 Confirm the phone on the WESM

Go to the WESM and confirm that you can now see the phone in Device Association > Wireless Stations:

Note that you can view the phone's MAC address, IP address, WLAN, VLAN, Radio Index, etc.

5. Fast roaming

Layer 2 roaming occurs when a phone that was associated to a radio port moves to another radio port adopted by the same WESM. The phone remains in the same VLAN.

Layer 3 roaming happens when a phone moves between two radio ports associated to different WESM modules. The voice WLAN is associated with different VLANs (and subnets) on the two modules. In this case, the phone keeps its originating IP address but the voice flow is tunneled by the current module to the home module.

For more information on L2/L3 roaming configurations, please refer to ProCurve Application Note AN-M3, *How to configure L2 and L3 wireless roaming*.

5.1 Fast roaming options

To enable a phone to transition faster between two radio ports and reduce the roaming time, you can configure these options:

- PMK caching
- Opportunistic key caching
- Pre-authentication

These options are available with 802.1X authentication.

The Siemens Gigaset SL75 WLAN phone supports 802.1X authentication with the following protocols:

- LEAP
- EAP-TLS, which requires importing a certificate to the phone

Note that PEAP is not supported in the Siemens phone, which is why this application note uses WPA2-PSK.

5.2 Configure self-healing

The self-healing feature enables associating neighbors to each radio port. In case of failure of a radio port, the neighbors increase their transmit power to provide coverage and compensate for the failed RP. You can also enable interference avoidance, which causes radios to change their channel settings to avoid interfering with surrounding radios.

To enable self-healing:

1. In the WESM, from the Special Features > Self Healing > Configuration tab, check the Enable Neighbor Recovery box, then click Apply.

2. Then from the Neighbor Details tab click Detect Neighbors.
3. You can now edit an RP radio to check that the other radios with same 802.11 mode (a or b/g) have been listed as neighbors.

Radio Index	Description	Type	RP Ethernet MAC	Action	Neighbor Radio Indices
1	RADIO1	802.11bg	00-14-C2-A0-6B-D0	Both	2,4
2	RADIO2	802.11bg	00-17-A4-9B-6F-0B	Both	1,4
3	RADIO3	802.11a	00-17-A4-9B-6F-0B	Both	6
4	RADIO4	802.11bg	00-17-A4-9B-6F-57	Both	1,2
5	RADIO5	802.11a	00-17-A4-9B-6F-57	Both	None
6	RADIO6	802.11a	00-14-C2-A0-6B-D0	Both	3

5.3 Test roaming time

You can determine the roaming time by first using the WESM to determine the radio port to which the phone is associated. To test roaming time:

1. From Device Association > Wireless Stations, note the radio's Station Index.
2. Go to Device Association > Radio Adoption Statistics and determine the MAC address of the corresponding radio port.
3. To determine the switch port associated with this MAC address, use ProCurve Manager's Find Node tool.
    - Use the command show lldp info remote all on the switch if the radio ports are connected at layer 2.
    - Or use show arp if the radio ports have IP addresses.
4. From a machine on the network launch a ping to the phone IP address:

```
C:\Documents and Settings\hpadmin>ping 10.3.108.156 -t

Pinging 10.3.108.156 with 32 bytes of data:

Reply from 10.3.108.156: bytes=32 time=56ms TTL=64
Reply from 10.3.108.156: bytes=32 time=61ms TTL=64
Reply from 10.3.108.156: bytes=32 time=150ms TTL=64
Reply from 10.3.108.156: bytes=32 time=990ms TTL=64
Reply from 10.3.108.156: bytes=32 time=194ms TTL=64
Reply from 10.3.108.156: bytes=32 time=56ms TTL=64
```

5. From the switch CLI or Web agent disable the port of the RP to which the phone is associated. The phone should lose one or two pings, then subsequent pings should be successful again, indicating the phone has associated to a different RP:

```
Reply from 10.3.108.156: bytes=32 time=1914ms TTL=64
Reply from 10.3.108.156: bytes=32 time=261ms TTL=64
Reply from 10.3.108.156: bytes=32 time=212ms TTL=64
Reply from 10.3.108.156: bytes=32 time=248ms TTL=64
Request timed out.
Request timed out.
Request timed out.
Reply from 10.3.108.156: bytes=32 time=272ms TTL=64
Reply from 10.3.108.156: bytes=32 time=134ms TTL=64
Reply from 10.3.108.156: bytes=32 time=131ms TTL=64
```

6. Configuring 802.11e and UAPSD

This section details how to configure WMM (802.11e) and Unscheduled Automatic Power Save Delivery (UAPSD).

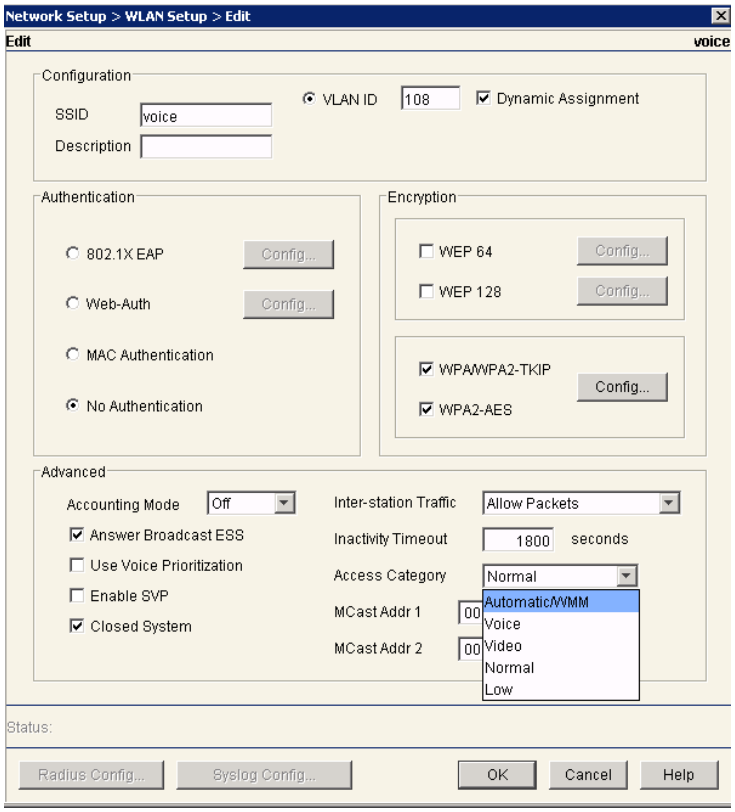
6.1 Configure WMM on the WESM

To prioritize voice traffic you can configure WiFi Multimedia (WMM), which is a WiFi Alliance interoperability certification based on the 802.11e standard. WMM automatically defines four classes of traffic that will be queued and prioritized accordingly.

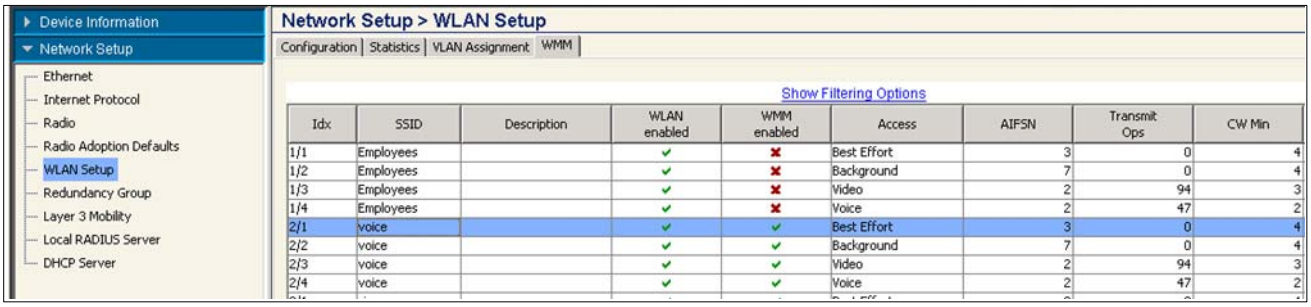
To configure WMM on the Wireless Edge Services Module:

1. Edit the voice WLAN.
2. In Advanced Parameters, set the Access Category to Automatic WMM.
3. In Network Setup > WLAN Setup > Edit screen, go to the WMM tab and verify that the voice VLAN is configured for WMM with four queues: Voice, Video, Background and Best Effort.
4. If desired, you can modify the parameters of these different classes of traffic:
    - AIFSN, Arbitration IFS Number, the default time before countdown.
    - CW minimum (CWmin), the minimum contention window.
    - CW maximum (CWmax), the maximum contention window.
    - Transmit Ops (TXOP), the opportunity to transmit. This is the time during which a station that has won the control of the shared medium can retain it.

Use DSCP or 802.1p priority (DSCP by default).



5. Click OK to accept Automatic/WMM as the Access Category. Wireless traffic is placed in the four queues according to its 802.1p priority (default) or DSCP value.



Note that for each queue, the four parameters are defined: AIFSN, CW minimum, CW maximum and Transmit Ops.

For more information on WMM configuration on the WESM, please refer to ProCurve Application Note AN-M12, *Using 802.11e and WMM on the ProCurve Wireless Edge Services Module*.

6.2 Using UAPSD on the Siemens wireless IP phone

UAPSD (Unscheduled Automatic Power Save Delivery) has been adopted by the WiFi Alliance, where it is known as WMM Power Save. This technology allows saving battery power and fine-tuning the power consumption of wireless stations on WMM-enabled wireless networks.

No special configuration for UAPSD is necessary for the Siemens Gigaset SL75 WLAN phone, which natively supports UAPSD. Siemens explicitly recommends using an access point that supports WMM. See the discussion of “Power consumption” on page 115 of the *Gigaset SL75 WLAN User Guide,* available at:

http://gigaset.siemens.com/shc/0,1935,hq_en_0_122755_rArNrNrNrN_variation%253A-5_pageType%253Amanuals_imagePos%253A2,00.html#content

On the WESM's Device Information > Wireless Stations window, the Gigaset SL75 phone appears as being in Power Save mode:

7. Firmware versions and phone upgrades

This section provides version numbers of firmware used for this application note, and explains how to upgrade the Siemens phone.

7.1 ProCurve switch and WESM firmware

Firmware versions of the switches used for this application note are as follows:

- K.13.09 for the ProCurve Switch 5406zl
- WT.01.15 for the ProCurve WESM zl

7.2 Siemens phone firmware

Firmware used on the Siemens Gigaset SL75 Wireless phone is as follows:

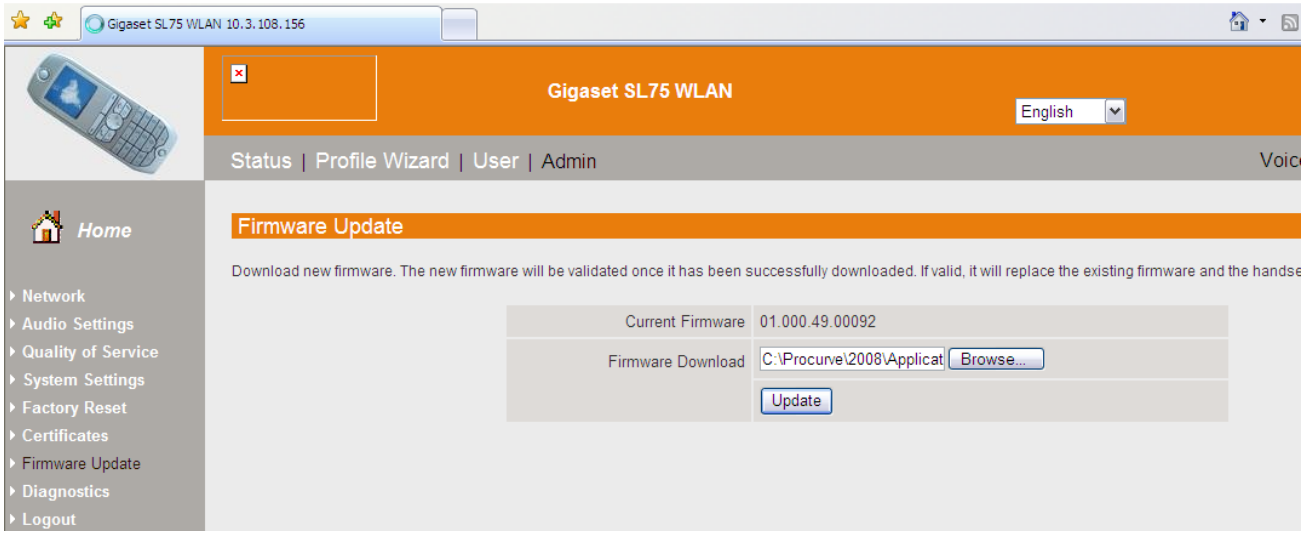
- `FW_Gigaset_SL75_V54.exe`

7.3 Upgrading firmware in the Siemens wireless IP phone

Firmware updates are available for free on the Siemens web site:
http://www.siemens.com/gigasetcustomercare

To upgrade the phone's firmware:

1. Download the latest firmware package and extract it locally on a PC.
2. From the PC, access the Web configurator on the phone (http://<*phone-ip-address*>) and go to the Admin > Firmware Update page.
3. In the Firmware Download filed, browse to the firmware file you downloaded and click Update.



You can then follow the upgrade process on the phone screen. The following messages appear in order:
SW UPDATE – DOWNLOAD-
SW UPDATE- CHECK-
SW UPDATE- ERASE-
SW UPDATE –WRITE-

At the end of the firmware update, the phone reboots automatically.

8. Reference documents

This concludes the procedures for interoperating ProCurve switches with the Siemens Gigaset SL75 WLAN phone.
For further information about how to configure ProCurve switches to support mobility, please refer to the following links:

- For user manuals for ProCurve 3500yl-5400zl-8212zl switches:
  http://www.hp.com/rnd/support/manuals/3500-6200-5400-ChapterFiles.htm
- For ProCurve WESM zl manuals:
  http://www.hp.com/rnd/support/manuals/wireless_zl.htm
- For PCM+ and IDM manuals:
  http://www.hp.com/rnd/support/manuals/ProCurve-Manager.htm
  http://www.hp.com/rnd/support/manuals/IDM.htm

- For information about the Siemens Gigaset SL75 WLAN phone:
  http://www.siemens.com/gigasetcustomercare
- For the Siemens *Gigaset SL75 WLAN User Guide*:
  http://gigaset.siemens.com/shc/0,1935,hq_en_0_122755_rArNrNrNrN_variation%253A-5_pageType%253Amanuals_imagePos%253A2,00.html#content

For further information, please visit www.procurve.eu

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